



“Cognitive categorization of new hybrid products and implicit attitude formation: Empirical study of sensory stimulation”

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COGNITIVE CATEGORIZATION OF NEW HYBRID PRODUCTS AND IMPLICIT ATTITUDE FORMATION: EMPIRICAL STUDY OF SENSORY STIMULATION

Abstract

According to social psychology researchers, categorizing a new product may involve the formation of automatic judgments at the subconscious level. This study aimed to ascertain if attitudes might be formed unintentionally when categorizing a new hybrid product under the effect of associated sensory inputs. Data were collected using an explicit and implicit approach: an explicit categorization measure, an explicit attitude scale, and the "Single Category Implicit Association Test" (SC-IAT), from 280 Moroccan university students having a normal sense of smell and taste, under the effects of two types of sensory stimuli (smell and taste) and according to two learning conditions linked to two categories of existing products. The data were then computed and processed using the "Statistical Package for Social Sciences" and the "Inquisit Lab". The study's findings revealed that the respondents were able to categorize the new product into one of the targeted categories (depending on the learning condition of each category) after exposure to sensory stimuli (olfactory and gustatory stimuli) related to this product and were also able to form an implicit and explicit attitude towards it. The occurrence of the categorization process and the formation of these two distinct types of attitudes can be explained by the olfactory and gustatory sensory stimulation during the experiment, which helped the participants recognize the basic domain of the new product and then transfer knowledge and affects to it.

Keywords

cognitive psychology, sensory stimuli, knowledge transfer, categorization process, automatic evaluation, deliberate evaluation

JEL Classification

M31, D13, D12

INTRODUCTION

Innovation, at the heart of marketing strategies, represents the extension of each person's creative process. Activating this creativity within a company is like igniting a dormant engine and activating the energy in everyone, to give meaning to people, teams, and company objectives. Innovation has become a major issue for companies, because of the opportunities it offers and risks and uncertainties it generates. Despite the large number of innovations offered in the market, the academic and economic field reports high failures of new products (Heidenreich et al., 2016; Srivastava & Sharma, 2012). These failures are due to ignorance and a lack of consumers' understanding of the innovative product, especially if it is part of a new category. Therefore, to understand and make sense of innovative products, consumers do not need to change their old knowledge structures but rather build new ones (Gregan-Paxton et al., 2002).

Often mocked, sometimes hated, and now abandoned, the Jimmy Dane 'Pancakes & Sausage' has always struggled to convince and has never established itself as a real combination between chocolate chip

pancakes and sausage. Consumers did not seem to understand what the ‘Jimmy Dane’ new product was. Is it a meal for breakfast or is it just a snack? Given the number of inferences made by consumers about the attributes, functionalities, and quality of existing products, a new product’s initial success depends on how it is linked to an existing category (Gregan-Paxton & Moreau, 2003; Kum et al., 2012). Therefore, the formation of consumers’ attitudes towards the new product is conditioned by these inferences (Moreau et al., 2001b; Rajagopal & Burnkrant, 2009), which will encourage or discourage the use of the new product as soon as it hits the market.

1. LITERATURE REVIEW AND HYPOTHESES

The study of perception receives constant attention in cognitive and social psychology. Why be interested in it? Because quite simply, the individual acts according to what he perceives. Nothing is more subjective than a perception. The mechanism of perception is defined as the “*categorization process in which, following a logic of inference, individuals use received signals to construct a categorical identity*” (Bruner, 1957). By learning to perceive, “*individuals learn the relationships between the properties of objects and events encountered; they learn to predict and check what goes with what*” (Bruner, 1957). Originally developed in cognitive psychology, cognitive categorization is defined as grouping non-identical objects or products into categories, allowing the individual to simplify and structure his perception of the environment (Ingarao, 2006). Following this definition, categorization is therefore an information processing process, by which the individual evaluates one or more objects, compares it to a reference element of the category, considers them to be similar or equivalent and, if applicable, associates them together as well as the information which concerns them. According to recent studies, after a new product has been categorized by consumers, they may consciously or unconsciously transfer their prior knowledge of the identified product category to the new product (Gregan-Paxton & Moreau, 2003). This helps to understand new product users and affects their attitude towards it. Some studies of the knowledge transfer literature hypothesize that cognitive efforts are necessary to classify new products (Feiereisen et al., 2008; Gregan-Paxton et al., 2002, 2005; Moreau et al., 2001a).

According to the Human Associative Memory (HAM) model, a product category’s whole knowledge structure may be activated by exposure to a

single perceptual or conceptual cue (Anderson & Bower, 1973). This model represents memory as a system of interconnected individual nodes containing information stored in the human mind and mutually activating in pertinent circumstances (Anderson, 1983). These nodes may be considered as memory traces from previous learning experiences. It is suggested that the knowledge can propagate through the network once the relevant knowledge structure is accessible. According to categorization theory, knowledge is classified in consumers’ long-term memory as cognitive categories formed as soon as two distinct items or events are evaluated equally (Mervis & Rosch, 1981). Two processes are advanced by the literature in cognitive psychology to explain how knowledge transfer affects the formation of attitudes towards new products. Sujana (1985) distinguished between a review process for each attribute in which consumers analyze each characteristic separately before reaching a final judgment, and an affective categorization process, in which consumers recover a previously created emotional assessment linked to the target category and link it to the new product. According to preliminary research by Sujana (1985), customers evaluate new products more quickly when they draw on their category-specific prior knowledge rather than going attribute-by-attribute. Since customers can deduce the required information about the new product and develop an attitude toward it, encouraging them to incorporate the new product of a target category into their knowledge structure is a key marketing objective.

However, classical models of knowledge transfer learning require participants to read a fictitious new product’s description and then report their assessment (Feiereisen et al., 2008; Feiereisen et al., 2013; Gregan Paxton et al., 2002, 2005; Moreau et al., 2001a). Even though this approach is still used, it does not address actual consumption sce-

narios in which consumers are exposed to lots of advertisements and have limited time to view them (Fischer et al., 1989). Under such conditions, learning may be more incidental than purposeful as consumers may unconsciously process these messages (Hawkins et al., 2001). This particular situation has not received enough attention in the literature on knowledge transfer. However, strategies of knowledge transfer learning can facilitate the categorization and assessment of new products automatically, since consumer judgments and preferences can also arise from automatic and unconscious processes (Bargh, 2002). Therefore, automatic and subconscious attitude development and emotional aspects, such as desires, might be a part of the categorization process (Zajonc, 1980).

A process is direct when individuals are unable to declare their preferences themselves because their attitudes are formed unconsciously. Likewise, recent studies have confirmed that an early attitude can be formed towards a new item before the individual can verbalize it (Dempsey & Mitchell, 2010). The above argument can be demonstrated using a concrete example. Consumers may have categorized the sport utility vehicle (SUV) as either a truck or a limousine when it first emerged as a new product (Rosa et al., 1999; Ackermann et al., 2018). Consumers who loved trucks would have instantly adopted a positive attitude towards SUVs if this type of vehicle had been categorized in the truck category. This is because they would have remembered an earlier positive relationship with SUVs. This example shows how categorization impacts belonging to the category of “trucks” to “SUVs” and requires the transfer of knowledge. However, because the transfer occurred unintentionally, customers may not understand their preferences for SUVs at first. The above example provides enrichment for the research on consumer categorization, as it is suggested that the categorization process might lead to the development of an attitude. Cognitive psychology researchers differentiate between unintentional “implicit” attitudes and intentional “explicit” attitudes (Gawronski & Bodenhausen, 2006; Greenwald & Banaji, 1995) to support their claim that individuals may form an “implicit” attitude toward a new product while categorizing it even though they have not yet developed an “explicit” attitude. This “implicit” attitude is formed below the level of consciousness in an

associative way. Consumers’ implicit attitudes regarding new items are thought to be connections of evaluative memory that, once formed, cannot be reversed and may influence their explicit attitudes in the future (Gregg et al., 2006; Ratliff et al., 2012). Furthermore, when implicit attitudes are spontaneously developed after the first encounter with a new product, they can objectively assess that encounter’s impact. Since explicit attitudes typically take longer to establish, they are more susceptible to exogenous communication variables’ distortion. Therefore, the usefulness of measuring implicit attitudes is seen especially during the testing phase of the new product because it offers a precise criterion through which marketers can adjust their communication strategy to achieve the desired categorization. According to knowledge transfer learning theory, categorizing new products and developing attitudes towards them requires cognitive effort (Gregan Paxton et al., 2002). However, this statement supposes that the attitude toward a new product can only be developed after the categorization process and appears to be intentional and conscious (Lajos et al., 2008). It is also necessary to point out that the start of the knowledge transfer process requires sensory stimulation. This is why two types of sensory stimuli (smells and tastes) have been chosen to conduct the experiment. Therefore, it is essential to ask the following question: What effects do odors and tastes have on categorization and implicit attitude formation towards new products? The ability of smells to elicit emotional responses and memories gives researchers the possibility to use them as appropriate emotional stimuli. Kaeppler and Mueller (2013) consider that the most prominent aspect through which humans perceive odors is valence (pleasant or unpleasant odor) (De luca & Botelho, 2020). Generally, it is considered that the sensory characteristics of objects are memorized implicitly and involuntarily at a very young age. So each individual’s preferences are influenced by smells outside of his awareness (Jacquier et al., 2012; De Luca & Botelho, 2020). So, according to De Luca and Botelho (2020), the paper presumes that categorization is only triggered by exposure to odors assessed as familiar (as opposed to unfamiliar). For example, when the individual is exposed to an odor from a product that is part of an already existing category, it increases the recall and the categorization of new products related to the same cat-

egory (Morrin & Ratneshwar, 2003), whatever the congruence of the odor with the product category. It has been concluded through previous research that the processing of unknown olfactory stimuli requires more attention than the processing of familiar olfactory stimuli (smells of a product of an existing category) because the unknown stimuli have no trace in the consumer's brain and cannot be easily processed (Kim & Rehder, 2011; Pieters et al., 2002). Recent studies have shown that odors allow individuals to recall attributes of a product or brand stored in their memory (Krishna et al., 2010; Morrin & Ratneshwar, 2000; De Luca & Botelho, 2020). Therefore, the presentation of an olfactory stimulus during the learning phase enables the response to a similar stimulus during the identification phase (Schifferstein & Blok, 2002; De Luca & Botelho, 2020).

Regarding taste, many studies consider it the most important criterion of choice for the consumer (Thompson et al., 1994; Mitchell & Boutani, 1992; Cardello, 1996; Sirieix, 1999; Lenglet, 2007). The taste sensory tools give us the ability to differentiate between different tastes such as sourness, sweetness, saltiness, bitterness, and umami. Taking taste stimuli into account is necessary for marketers because the beliefs and knowledge formed during previous tastings affect the act of purchase (Grunert, 2003; Lenglet, 2007), while pleasure determines consumption (Lenglet, 2007). Generally, declarative surveys do not really make it possible to dissociate the role of taste and information associated with the product. Taste preferences are generally found to be strong in blind evaluation tests (Lenglet, 2007). Taste is mainly characterized by its close association with scents because it can be affected by other senses (Pugliesi, 2021). Therefore, this paper suggests that the categorization process leads to the transfer of knowledge from an existing category to the new product identified in the same category after a tasting phase.

The purpose of using olfactory and gustatory stimuli in this study is to observe their effects on the knowledge transfer process and thus conclude their effect on the categorization of a new item. Therefore, this paper aims to investigate the impact of odors and tastes on the process of categorization and the development of implicit and explicit attitudes. The implicit attitude was considered as

part of the knowledge transferred to the new product to emphasize that this attitude is instantaneously, unconsciously, and spontaneously triggered during the categorization process. Although implicit and explicit attitudes are distinct, they can influence each other (Whitfield & Jordan, 2009). Gawronski and Bodenhausen (2006) consider following the Associative-Propositional Evaluation model that there is a mutual influence between these two types of attitudes.

Therefore, this study aims to discover how consumers categorize and develop implicit attitudes toward new hybrid products relating to more than one category, under the effect of olfactory and gustatory stimuli from both categories.

Thus, the following hypotheses were formulated:

- H1: *An exposure to sensory stimuli related to a new hybrid product leads to the categorization of the new product into one of the target categories.*
- H2: *An exposure to sensory stimuli associated with a new hybrid product leads to the development of an implicit attitude towards the new product.*
- H3: *An exposure to sensory stimuli associated with a new hybrid product leads to the development of an explicit attitude towards the new product.*

2. METHODS

2.1. Experimental protocol

280 young university students from Rabat were selected using a non-probability convenience sampling technique (150 women, 130 men; average age = 22 years old). They confronted a fictitious hybrid food product in an experiment divided into two phases (the learning phase and the testing phase). According to Gill and Dubé (2007), hybrid products are considered new innovative products with characteristics of more than one product category. They are therefore like "conjunctions of two normally disjoint products" (Gibbert & Mazursky, 2009; Ackermann et al., 2018). Two categories of

products were chosen for their high level of familiarity, the yogurt category and the dessert cream category, thus promoting the presence of accessible categories in the minds of consumers, and therefore making hybrid products easy to understand. Participants were required to have a normal sense of smell. To ensure that the respondents cannot suspect the real goal of the study, they were invited to participate in this experiment under the pretext of participating in a study on how people categorize the information from their environment. They were invited to a 60-minute session during their lunch break and were asked not to wear perfume on the day of the experiment. After the completion of the learning phase, two explicit measures were used to assess categorization and explicit attitudes as well as an implicit measurement tool such as the Single Category Implicit Association Test (SC-IAT) to measure implicit attitudes.

2.2. Sensory stimuli and procedure

The olfactory stimuli chosen in this study were diffused using two concentrated scents of vanilla and coconut-biscuit diluted in a silent and hidden electric vaporizer. In this study, a between-subjects design of 2 (Sensory stimuli: the smell of vanilla and coconut biscuit vs taste of vanilla and coconut biscuit) \times 2 (Category: yogurt vs dessert cream) was carried out.

Whether it is a molecule or an aromatic composition, selecting fragrances requires the organization of pre-tests to characterize them (Gaillet-Torrent, 2013). To confirm the choice of these olfactory stimuli, two preliminary studies were conducted with participants different from those included in the study. The first study was conducted with 22 participants, and they rated the smell of vanilla as familiar in the yogurt category ($M = 8.5$; $SE = 0.55$). For the smell of coconut-biscuit, a second preliminary experiment was conducted with 20 participants different from those included in this experiment, 39% of

them admitted that the smell made them want to eat a coconut-based dessert. The hybrid product chosen in this study is a “biscuit yogurt” made up of a mixture of a coconut-based shortbread biscuit and vanilla yogurt and it has the name “YAOUBIS”. The choice of the “YAOUBIS” hybrid product is justified by the high level of familiarity of the two categories (yogurt/cream dessert) for consumers. Participants will use information from several categories to transfer knowledge from these categories to the new product only when they are specifically told that the hybrid product needs to be compared to multiple categories (Moreau et al., 2001b; Ackermann et al., 2018). During the scent broadcast, the participants tasted YAOUBIS which was offered to them in an anonymous plastic pot in the experimentation room, and they were then asked to respond to specific questions about the attributes (scent, taste, and ingredients) of YAOUBIS. The tasting time was maintained at 10 minutes. After a 20-minute exposure to the scent of vanilla and coconut biscuits and also the tasting phase, the new product was categorized by participants as belonging to one of the two categories and consequently transferred their beliefs and attitudes towards this category to the new hybrid product. After consultation, respondents answered questions regarding the new product’s categorization, then their implicit and explicit attitudes towards the new product offering were measured. The paper followed the model of Ackermann et al. (2018) to measure implicit and explicit attitudes towards “YAOUBIS”. Therefore, to apply this model, the measure of implicit attitudes was made based on the modified version of the Single Category Implicit Association Test (SC-IAT) developed by Karpinski and Steinman (2006). The standard procedure for calculating SC-IAT scores (Karpinski & Steinman, 2006) was followed, and therefore, six participants who had more than 25% false answers were excluded. As a result, 274 observations (55.4% female) with complete responses were retained.

Table 1. Odorization procedure according to Gaillet-Torrent (2013)

Condition	Scent	Intensity	Broadcast temporality	Diffuser settings
Yogurt learning condition	Vanilla	Perceptible	10-minute booster diffuser after participants enter	2 “puffs” of 60 s with 20 s pause
Dessert cream learning condition	Coconut Biscuit	Perceptible	10-minute booster diffuser after participants enter	2 “puffs” of 60 s with 20 s pause

2.3. Implicit attitude measurement

The SC-IAT is a version of the implicit association test designed to measure responses to a single concept with no obvious alternative, such as value notions (Yue et al., 2021). The validity of the SC-IAT has been confirmed through previous research (Karpinski & Steinman, 2006, 2008; Nevid & McClelland, 2010; Ackermann et al., 2018). A scheduled online survey on the Inquisit Lab was set up for participants. The Inquisit Lab is dedicated to designing experiments and collecting psychological data online or on lab computers. The website provides millisecond accuracy of stimuli presentations and responses, so it is suitable for IAT administration. Based on the SC IAT, measures of implicit attitude were made following a sequence of three discrimination tasks: Attribute Category Discrimination Task, Initial Combined, and Reverse Combined. Every discrimination task links YAOUBIS to two categories of opposite attitudes (“good” and “bad”). The “Good” attribute category was illustrated by words having a pleasant meaning and the “Bad” attribute category was illustrated by words having an unpleasant meaning. Implicit attitude is therefore measured based on reaction time. Participants should then respond to attribute words that appear in the center of the computer screen set up in the experiment room. When the reaction time is fast and YAOUBIS and “Good” share the same key, the implicit attitude is positive, and when the reaction time is fast when YAOUBIS and “Bad” share the same key, the implicit attitude is negative. So, the respondents had to very quickly press a button corresponding to the different categories. For the combined initial discrimination task: the left button for the stimuli related to “YAOUBIS” and “bad” and the right button for the stimuli related to “good”. For the inverse combined discrimination task: the left button for the stimuli corresponding to “bad” and the right button for the stimuli related to “YAOUBIS” and “good”.

A block of 20 trials was finalized by each respondent for the attribute category discrimination task and then a block of 40 trials for the initial combined discrimination task, followed by a block of 40 trials for the reverse combined discrimination task. For this last task, YAOUBIS “good” and YAOUBIS “bad” were counterbalanced between

participants to control order effects. To calculate the SC-IAT scores, the reference procedure of Karpinski and Steinman (2006) was followed: After a response time of 350 ms, the stimulus disappears from the screen, and responses exceeding this time are not considered. Five respondents having an error rate of more than 25% were disqualified from the study; Error latencies are replaced by the average response time in which the error occurred, plus a standard penalty of 400 ms. The difference between the mean response time of the initial combined task and the final combined task is normalized by the standard deviation of the correct trials under both conditions.

2.4. Categorization measurement

According to the Ackermann et al. (2018) model, the learning category was defined as the independent variable linked to H1. After developing a measurement scale ranging from 1 = “definitely yogurt” to 7 = “definitely dessert”, participants were invited to categorize directly, YAOUBIS in one of the two product categories (Yogurt/dessert cream) (the result of the categorization is considered as the first dependent variable). Then, participants were asked to express their expectations of YAOUBIS in terms of attributes related to ingredients, tastes, and smells. For this, a list of 15 attributes related to the two categories (Yoghurt and Cream dessert) was given to them, and they had to choose 7 attributes. This attribute association was considered the second dependent variable. Then, a general linear model was opted, with one independent variable (learning category) and two dependent variables (categorization results and attributes associations).

2.5. Explicit attitude measurement

A questionnaire containing certain items was developed following the Maison et al. (2004) model to measure explicit attitude (dependent variable linked to H3). Affection: (5-point scale: 1 = don’t like; 5 = like very much); consumption frequency: (5-point scale: 1 = more often yogurt than dessert cream; 5 = more often dessert cream than yogurt); Evaluation: distinct assessment of YAOUBIS in the two conditions on six different bipolar dimensions each rated on a 5-point scale (taste not distinctive-distinctive, not nutri-

tious-nutritious, not tasty-tasty, not natural-natural, not light-light, not worth buying-worth buying); Preference: (1 = would rather eat yogurt; 5 = would rather eat cream dessert).

3. RESULTS

In the yogurt learning condition and under the effect of vanilla smell, and also after the tasting phase, the participants did not consider the YAOUBIS hybrid food product as a yogurt [$(M = 3.53; SE: 0.19); t(139) = 3.68, p = 0.010$], but rather considered it as a cream dessert in the cream dessert learning condition under the effect of the coconut biscuit smell and after the tasting phase ($M = 5.58; SE: 0.13$); ($t(130) = 8.67, p = 0.000$). This result can be associated with the fact that the product was offered in a packaging that did not refer to yogurt and also to the coconut biscuit added to the vanilla yogurt, as well as to the smell of the coconut biscuit, which strongly impacted the categorization process. The outcome of the categorization was found to be significantly influenced by the learning category ($F = 13.91; p = 0.000$), and the number of yogurt combinations ($F = 39.91; p = 0.001$). Overall, the results indicate that the categorization of YAOUBIS into one of the targeted categories took place after a sensory exposure (olfactory exposure and tasting). So, hypothesis 1 is asserted.

The odors diffused, as well as the tasting of YAOUBIS, induced positive implicit attitudes in the two learning conditions [(cream dessert: $t(130) = 5.71, p = 0.000$ and yogurt: $t(139) = 4.65, p = 0.00$]. Results showed that when YAOUBIS was combined with positive words, respondents' average reaction times were considerably reduced. So, hypothesis 2 is affirmed. In the yogurt learning condition, the results indicated an explicit negative attitude towards YAOUBIS ($M: 3.10; SD: 0.12$), contrary to the cream dessert learning condition, in which participants indicated a positive explicit attitude ($M: 4.5; SD: 0.10$). In both learning conditions, the explicit attitude means were significantly different from the scale mean (Cream dessert learning condition: $t(130) = 5.94, p = 0.054$; Yogurt learning condition: $t(139) = 3.08, p = 0.04$). These findings lead to the conclusion that exposure to sensory stimuli is sufficient

to develop an explicit attitude towards a new hybrid product belonging to more than one category. So, hypothesis 3 is affirmed.

4. DISCUSSION

The paper assumed that exposure to sensory stimuli related to an innovative product belonging to two existing categories leads to the categorization of the new product into one of these categories and also leads to the formation of an implicit and explicit attitude towards this new product. Through the results of the categorization, it can be concluded that the olfactory and taste stimuli trigger the knowledge transfer process and therefore lead to the categorization of the new product in the targeted category. Thus, it was concluded that during the knowledge transfer process, an implicit attitude is formed below the consumer's awareness threshold. The results for explicit attitudes showed that the sensory information about the new product to which the participants were exposed was sufficient for the formation of explicit attitudes. Therefore, the fact that the participants were able to form an implicit and explicit attitude is strongly due to the sensory stimulation of the participants through the odors diffused and the tasting of the new product. The tasting of YAOUBIS allowed the participants to discover its flavors and its intrinsic attributes, which allowed them to have more information about it. The smells also had a significant impact on the participants, as they probably revealed past experiences to them. Since the smell directly addresses the limbic area of the brain responsible for managing emotions. Therefore, the diffused odors probably had an impact on the knowledge transfer process by inducing categorization and implicit and explicit attitude formation. Therefore, the paper postulates that the choice of these sensory stimuli facilitated the categorization of this new hybrid product, despite its ambiguity, without forgetting the base of the product (yogurt), which was quite familiar to the participants, so it facilitated much more the process of categorization. Therefore, the choice of the basis of a hybrid product from more than one category is an important factor that facilitates the discovery of the new product by consumers.

When analyzing the results, a contradiction was found between the implicit attitude and the explicit

it attitude formed in the yogurt learning condition. The formation of a positive implicit attitude in the yogurt learning condition is probably due to the diffused vanilla scent and tasting experience, and the formation of a negative explicit attitude in the same learning condition may be due to weak traces of past experience with such a product. This inconsistency between the implicit attitudes and the explicit attitudes formed during the categorization process represents a common point between these results and the results of Ackermann et al. (2018). This dis-

sociation can also be explained by the participants' refusal of the propositional assessment implied by their affective response. In the results of Ackermann et al. (2018), explicit attitudes were not fully formed despite varying levels of attention and the presence of visual stimuli during the experiment. Contrary to their results, the explicit attitudes in this study were fully formed, so this may be explained by the nature of the stimuli used and their intensity (the intensity of the odors used in this study was sufficient to start the formation of implicit and explicit attitudes).

CONCLUSION

The current study aimed to analyze the process of categorization of innovative products and to show whether during this process participants can form an implicit and an explicit attitude toward the new hybrid product under the influence of olfactory and gustatory stimuli. The results show that despite the limited information about the new product, respondents were able to identify its base domain related to each of the two targeted categories. The occurrence of categorization is probably due to the influence of olfactory and gustatory sensory stimuli. The first conclusion that can be drawn from this observation is that the human senses have a great capacity to evoke the knowledge anchored in his brains. The present results also demonstrate that the respondents were able to form an implicit and an explicit attitude towards the new product during the categorization process with some inconsistency for the explicit one. So, the second conclusion that can be drawn is that attitudes can be formed unconsciously during a knowledge transfer process under the influence, of course, of certain sensory stimuli. Although, during the same process, the individual can also form a complete explicit attitude with a probability of contradiction with the implicit one.

Despite achieving the paper's objectives, some limitations have been found. For example, the paper focused on only two sensory stimuli, consequently, the external validity of this research result could be affected. Further research could therefore use other sensory stimuli, such as visual and auditory stimuli. It would also be interesting to use new products developed from more than two categories. Future research is also necessary to better understand knowledge transfer mechanisms under the influence of various sensory stimuli and to know how consumers evaluate information from several existing domains.

AUTHOR CONTRIBUTIONS

Conceptualization: Bahoussa Abdelaziz, Masrhouni Ikrame.

Data curation: Bahoussa Abdelaziz, Masrhouni Ikrame.

Formal analysis: Bahoussa Abdelaziz, Masrhouni Ikrame.

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Writing – original draft: Bahoussa Abdelaziz, Masrhouni Ikrame.

Writing – review & editing: Bahoussa Abdelaziz, Masrhouni Ikrame.

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